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10/586,035	12/19/2006	Adalbert Feltz	14219-119US1 P2004.0032 U	1777
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EXAMINER				
HOBAN, MATTHEW E				
ART UNIT		PAPER NUMBER		
1734				
NOTIFICATION DATE		DELIVERY MODE		
06/14/2011		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary

Application No.

10/586,035

Applicant(s)

FELTZ ET AL.

Examiner

MATTHEW HOBAN

Art Unit

1734

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-20 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 2, 4, 5, 7, 8, 10-17 and 24 is/are allowed.
- 6) ☒ Claim(s) 6, 9, and 18-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/21/10
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the third-fifth paragraphs of 35 U.S.C. 112:

A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

A claim in multiple dependent form shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claim. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.

Claim(s) 6 and 9 is/are rejected under 35 U.S.C. 112, fourth paragraph, as being indefinite for failing to specify a further limitation of the subject matter claimed of a claim previously set forth. Specifically, these compositions include Mg as a B atom, a possibility that is prohibited by the current amendment.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1, 2, 8, 10 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokosuka in their publication as provided in the IDS dated 12/21/10.

Yokosuka teaches a ceramic material being a solid solution of 3 components, having a formula $x\text{Ba}(\text{Ca}_{1/3}\text{Nb}_{2/3})\text{O}_3-(1-x)\text{Pb}(\text{Zr}_y\text{Ti}_{1-y})\text{O}_3$. The value of x ranges between 0.1 to 0.4 and y ranges between 0 and 1.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsu in 5527481.

Regarding Claim 18: Otsu teaches a ceramic composition of the formula $Pb_1 \cdot xMe_x(Mg_{1/3}Nb_{2/3})_aTi_cZr_dO_3$, wherein x is between 0 and 0.12, a is from 0.01-0.1, c is from 0.3 to 0.6 and d is from 0.25 to 0.55 and M is chosen Sr, Ba, and Ca. Other oxide components comprise the mixed oxide and can be seen in for example on page 3 of the document. Thereafter this composition could be considered a solid solution (mixed crystal) of PZT-PMN and $M(Mg_{1/3}Nb_{2/3})O_3$, which is structurally and chemically the same as the composition claimed as a cryolite component $M_4(Mg_{4/3}Nb_{8/3})O_{12}$, where $x=1$. Thereafter, the teachings of Ushida represent an overlapping range of compositions with the instant claims. Overlapping ranges have been held to establish a prima facie case of obviousness over the prior art. See MPEP 2144.04.

Regarding Claim 19: The composition of Otsu does not contain any lead oxide in the form of a simple oxide.

Regarding Claim 20: The structure of Otsu is free of Potassium and thus must also be free of potassium niobate.

1. Claims 11-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Yokosuka as applied to claims 1 above, and further in view of Salto in 2003/0174553.

Yokosuka teaches a ceramic of the composition $x\text{Ba}(\text{Ca}_{1/3}\text{Nb}_{2/3})\text{O}_3-(1-x)\text{Pb}(\text{Zr}_y\text{Ti}_{1-y})\text{O}_3$.

Yokosuka does not teach the addition of certain additives seen in claims 14-17.

However, Salto teaches that the addition of perovskites such as those claimed are conventional in the art of creating a ferroelectric material especially tailored to be incorporated into a semiconductor memory device. Specifically Salto teaches that conventional additives within the art are as follows $\text{Pb}(\text{B}_{1/3}\text{B}_{2/3})\text{O}_3$, $\text{Pb}(\text{B}_{1/2}\text{B}_{1/2})\text{O}_3$, $\text{Pb}(\text{B}_{1/4}\text{B}_{3/4})\text{O}_3$, wherein the summation of B components are chosen to have a total valency of +4 and chosen from Li, Cu, Mg, Ni, Zn, Mn, Co, Sn, Fe, Cd, Cu, Sb, Al, Yb, In, Fe, Co, Sc, Y, Sn, Nb, Ta, Bi, W, Te and Re. Thereafter, Salto expressly discloses the use of at least those additives claimed instantly in claims 14-16. In terms of the additives taught in instant claim 17, the use of a combination of components including both Li and one of Nb, Ta, or Sb would necessarily have the same effect on the final composition as the object of the invention is a mixed crystal of the components and not to a ceramic having the original components intact. This situation is also the case for KNbO_3 as K is shown to be a possible dopant on the A site, thereafter the final composition could be described as incorporating potassium niobate dopants when such elements are added to the A site of the perovskite. Thereafter, it would have been

obvious to add any of the above components to the composition of Yokosuka. One of ordinary skill in the art would find that this was obvious based on their conventional nature and would be motivated to add said components based on the fact that Salto teaches that the addition of said components can effectively provide a thin film of ferroelectric material having superior dielectric characteristics (See Paragraph 235 of Salto).

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokosuka as applied to claims 1 above, and further in view of Zheng in their publication entitled "Effects of strontium substitution in Nb-doped PZT ceramics".

Yokosuka teaches a ceramic of the composition $x\text{Ba}(\text{Ca}_{1/3}\text{Nb}_{2/3})\text{O}_3-(1-x)\text{Pb}(\text{Zr}_y\text{Ti}_{1-y})\text{O}_3$.

Yokosuka is silent as far as other substitutions on the A-site.

However, Zheng teaches that the substitution of Pb for Sr in PZT-Nb doped perovskites leads to improvements in the overall character of the material. Substantial doping can occur as Zheng shows doping in excess of 16 mol%. The replacement of Sr for Pb in the composition would be obvious to one of ordinary skill in the art as it is clearly shown that Sr on the A site decreases the Curie temperature and broadens the dielectric constant maxima. Both of these factors would influence and motivate one of ordinary skill to dope the material in such a way. As the material is a solid solution or a mixed

crystal, the A site amongst all components are shared, so it could be said that the amalgam of Yokosuka and Zheng's teachings would be a mixture of several phases which could be described as including some amount of $\text{Sr}(\text{Ca}_{1/3}\text{Nb}_{2/3})\text{O}_3$.

Allowable Subject Matter

Claims 4 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

1. The following is an examiner's statement of reasons for allowance: The crystal structure claimed comprising one system having a cryolite structure is novel in that it has a chemistry that is not taught or obviated by the prior art. Specifically, this type of structure is known, but is typically only shown where the composition contains Zn or Mg on the B site (See 5527481). Ca, Ba, and Sr are typically only shown to be dopants on the A-site in perovskites for Pb or the like. Yokosuka shows Ca on the B-site, but it would still be not obvious to replace this Calcium for strontium. Thereafter, the composition having the claimed structure and chemical formula are found to be novel over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

2. Applicant's arguments with respect to claims 18-20 have been considered but are moot in view of the new ground(s) of rejection. The objection to claim 3 is withdrawn with the cancellation of the claims. The rejection over USC 112, 102 and 103 are withdrawn with the amendments to claims 1-17 and 24; however, this amendment has brought about a new 112 4th paragraph rejection. The amendment to claim 18 has overcome the rejection over Garg, but new art has been applied which ameliorates the deficiencies of Garg in light of the amendment to the claims. A new series of rejections have been included that are based on the IDS.

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 12/21/10 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW HOBAN whose telephone number is (571)270-3585. The examiner can normally be reached on Monday - Friday from 10 AM to 6:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emily M. Le can be reached on 5712720903. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C Melissa Koslow/
Primary Examiner, Art Unit 1734

/Matthew E Hoban/
Examiner, Art Unit 1734